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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ARNAB DAS, FAROOQ ULLAH KHAN,
ASHWIN SAMPATH, and HSUAN-JUNG SU

Appeal 2007-3802
Application 10/036,927
Technology Center 2600

Decided: March 21, 2008

Before KENNETH W. HAIRSTON, ANITA PELLMAN GROSS, and
JOHN A. JEFFERY, *Administrative Patent Judges*.

JEFFERY, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134 from the Examiner's rejection of claims 1-20. We have jurisdiction under 35 U.S.C. § 6(b). We affirm-in-part and enter a new ground of rejection under 37 C.F.R. § 41.50(b).

STATEMENT OF THE CASE

Appellants invented a method for retransmitting information in a channel of a wireless communication system in the presence of errors and low quality channels. Specifically, the invention uses fixed length frames and varies the numbers of codes used for the retransmission based on a condition of the communication channel. Such a system avoids the complexity and other problems associated with variable length transmissions.¹ Claim 1 is illustrative:

1. A method for retransmitting information in a communication channel of a wireless communication system, the communication channel including a plurality of fixed length frames each divided into a plurality of time slots of equal duration, the method comprising:

transmitting a code multiplexed retransmission of a previous transmission within one of the fixed length frames using one or more of a plurality of codes, wherein the number of codes used for the retransmission is variable based on the condition of the communication channel.

The Examiner relies on the following prior art references to show unpatentability:

| | | |
|----------|--------------------|---|
| Bolgiano | US 6,366,568 B1 | Apr. 2, 2002 (filed Oct. 4, 1995) |
| Kwan | US 2003/0081692 A1 | May 1, 2003 (filed Jun. 25, 2002) ² |

¹ See generally Spec. 3:4-23.

² This reference claims benefit of (1) Provisional Application 60/300,674 filed June 25, 2001, and (2) Provisional Application 60/301,078 filed June 26, 2001.

1. Claims 1-13 and 20 stand rejected under 35 U.S.C. § 102(b)³ as being anticipated by Kwan.
2. Claims 14-19 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Kwan and Bolgiano.

Rather than repeat the arguments of Appellants or the Examiner, we refer to the Briefs and the Answer⁴ for their respective details. In this decision, we have considered only those arguments actually made by Appellants. Arguments which Appellants could have made but did not make in the Briefs have not been considered and are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(vii).

OPINION

The Anticipation Rejection

We first consider the Examiner's anticipation rejection of claims 1-13 and 20 based on the disclosure of Kwan. "Anticipation is established only when a single prior art reference discloses, expressly or under the principles of inherency, each and every element of a claimed invention" as well as

³ Although the Examiner indicates the anticipation rejection is based on § 102(b) (Ans. 3), the reference actually qualifies as prior art under § 102(e) since it was published on May 1, 2003 which is after the filing date of the present application (Oct. 19, 2001), but was effectively filed before the present application's filing date. We consider this error harmless as it does not affect our decision regarding the merits of the anticipation rejection.

⁴ We refer to (1) the most recent Appeal Brief filed Oct. 3, 2006; (2) the most recent Answer mailed January 11, 2007; and (3) the most recent Reply Brief filed February 22, 2007 throughout this opinion.

disclosing structure which is capable of performing the recited functional limitations. *RCA Corp. v. Applied Digital Data Systems, Inc.*, 730 F.2d 1440, 1444 (Fed. Cir. 1984); *W.L. Gore and Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1554 (Fed. Cir. 1983).

The Examiner has indicated how the claimed invention is deemed to be fully met by the disclosure of Kwan (Ans. 3-6). Regarding representative independent claim 1,⁵ Appellants argue that Kwan does not disclose the recited *retransmission* method, namely transmitting code multiplexed retransmission of a previous transmission where the number of codes used for the transmission is variable based on the condition of the channel (App. Br. 4-5; Reply Br. 1; emphasis added). Appellants acknowledge that Kwan mentions retransmission, but Appellants emphasize that this statement is merely a general statement of the known retransmission scheme used in the HSDPA protocol (App Br. 5). Appellants note that Kwan is directed to a particular transmission scheme, but such a transmission scheme does not inherently dictate or imply that retransmissions must use the same scheme (Reply Br. 1). The Examiner takes the position that although Kwan does not expressly disclose that the transmission method applies also to retransmissions, Kwan's transmission method inherently applies to all types of transmissions, including retransmissions (Ans. 8).

⁵ Appellants argue claims 1-13 and 20 together as a group. See App Br. 4-5. Accordingly, we select claim 1 as representative. See 37 C.F.R. § 41.37(c)(1)(vii).

At the outset, we note that Appellants do not dispute the Examiner's findings with respect to Kwan's *transmission* method as disclosing various fundamental aspects of the method recited in representative claim 1, namely transmitting fixed length frames using one or more codes wherein the number of codes used for the transmission is variable based on the condition of the communication channel. Rather, Appellants dispute the Examiner's findings that Kwan inherently discloses that such a transmission capability in Kwan applies to *retransmissions* of previous transmissions.

The issue before us, then, is whether Kwan inherently teaches applying the disclosed transmission method to retransmissions of previous transmissions. That is, does Kwan's transmission method *necessarily* apply to retransmissions as well? For the following reasons, we conclude that it does not.

Kwan adaptively modulates a radio link in a mobile communication system according to radio link quality. To this end, Kwan's method selects a number of channelization codes and a modulation and coding (MCS) scheme from among plural MCSs for use by a transmitter over the radio link in accordance with the quality of the radio link (Kwan, ¶ 0011). This quality-based code selection is performed by executing the algorithm of Figure 1 (Kwan ¶¶ 0043-72; Fig. 1). Look-up tables may be also used which provide the number of possible channelization codes associated with each MCS (Kwan, ¶¶ 0012, 0073-74). The system also utilizes high-speed downlink packet access (HSPDA) standards⁶ and prefers a transmission time

⁶ See generally Kwan, ¶ 0006 (discussing feasibility of HSDPA systems).

interval (TTI) with respect to a given channel to have a length of 3 slots (2 ms) (Kwan ¶ 0078).

While we find Kwan's adaptive scheme selects a variable number of codes based on the condition of the communication channel, we find nothing in Kwan that indicates that this same scheme is or *necessarily* would be used for retransmissions. To be sure, Kwan does mention in passing in connection with HSDPA that HARQ retransmits the whole TTI if there are errors in any of the transport blocks (Kwan, ¶ 0146). While this passage may *suggest* that the same variable coding scheme *could* be used for retransmissions, there is no disclosure that it actually is used for retransmissions, and such mere possibilities are not enough for anticipation by inherency. To conclude that this brief, general reference to retransmissions with respect to HSDPA somehow means that Kwan's specific variable-coding transmission scheme necessarily applies to retransmissions, at best, requires us to resort to speculation. That we will not do.

For the foregoing reasons, we will not sustain the Examiner's rejection of independent claim 1 or dependent claims 2-13 and 20 for similar reasons.

The Obviousness Rejection

We now consider the Examiner's obviousness rejection of claims 14-19 over Kwan and Bolgiano. In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal

conclusion of obviousness. See *In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). In so doing, the Examiner must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966).

Discussing the question of obviousness of a patent that claims a combination of known elements, the Court in *KSR Int'l v. Teleflex, Inc.*, 127 S. Ct. 1727, 1740 (2007) explains:

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, §103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Sakraidia [v. AG Pro, Inc.]*, 425 U.S. 273 (1976)] and *Anderson's-Black Rock [v. Inc. v. Pavement Salvage Co.]*, 396 U.S. 57 (1969)] are illustrative—a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.

If the claimed subject matter cannot be fairly characterized as involving the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement, a holding of obviousness can be based on a showing that “there was an apparent reason to combine the known elements in the fashion claimed.” *Id.* at 1740-41. Such a showing requires “some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. . . . [H]owever, the analysis need not seek out precise teachings

directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *Id.* at 1741 (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

If the Examiner’s burden is met, the burden then shifts to the Appellants to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. *See In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

In the obviousness rejection, the Examiner cites Bolgiano for teaching a recited transmission domain and defining the transmission formats based on certain parameters and combines those teachings with Kwan to arrive at the claimed invention. Regarding representative claim 14,⁷ Appellants essentially reiterate that Kwan does not disclose the recited retransmission scheme in one of the recited domains and assert that Bolgiano does not cure this deficiency (App. Br. 5-6).

We will sustain the Examiner’s rejection of representative claim 14. Bolgiano discloses a wireless communication system that combines time and space diversity to reduce fading and simplify receiver design. Specifically, a data packet is transmitted at three different times from three different antennas. As a result, the receiver receives the same data packet at three

⁷ Appellants argue claims 14-19 together as a group. *See* App Br. 5-6. Accordingly, we select claim 14 as representative. *See* 37 C.F.R. § 41.37(c)(1)(vii)

different times from three different antennas, and uses the best data packet(s) to reduce the effects of fading (Bolgiano, Abstract; col. 2, ll. 46-51).

In one embodiment, a single transfer station transmits multiple repetitions of the same data packet from three space diversity antennas. In another embodiment, three different transfer stations (each with one of the space diversity antennas) transmit multiple repetitions of the same data packet. Significantly, the data packets could either (1) be identical, or (2) carry substantially the same information, but *modulated with different spreading codes* or different segments of the same spreading code (Bolgiano, col. 3, ll. 1-14; col. 4, ll. 24-53; Figs. 1-4; emphasis added).

Based on this functionality, we find that the collective teachings of Bolgiano and Kwan amply teach and suggest all limitations of representative claim 14. First, Bolgiano clearly teaches retransmitting packets. Indeed, skilled artisans need only examine the language of Bolgiano's claim 1 itself to confirm this point. *See* Bolgiano, col. 26, ll. 42-62 (text of claim 1).

Second, Bolgiano's retransmissions are not only in one of the recited domains (code, frequency, and space), the reference actually teaches all three. That is, (1) the code domain is taught by the use of spreading codes; (2) the space domain is taught by the use of three space diversity antennas; and (3) the frequency domain is taught by the use of frequency multiplexing and assigning each antenna a separate center frequency in certain configurations (Bolgiano, col. 15, ll. 60-65; col. 16, ll. 43-44; col. 17, ll. 29-32).

Third, and perhaps most significantly, Bolgiano teaches varying, among other things, the number of codes used in the retransmissions.⁸ As noted above, Bolgiano expressly states that the retransmitted packets can carry substantially the same information, but are *modulated with different spreading codes* or different segments of the same spreading code (Bolgiano, col. 3, ll. 1-14). In one implementation, user information is replicated in each of the three time slots, but the PN code continues to run and *is different during each time slot* (Bolgiano, col. 17, 34-41; emphasis added). Based on these teachings, Bolgiano amply teaches varying the number of codes used for retransmissions.

Therefore, combining these teachings with those of Kwan would have amply suggested the desirability of varying the number of codes not only for *transmissions* as in Kwan, but also for *retransmissions*. That Kwan strongly suggests that the disclosed variable coding transmission scheme may also be used for retransmissions (Kwan, ¶ 0146) as we indicated above in connection with the anticipation rejection only reinforces this conclusion.

For the foregoing reasons, Appellants have not persuasively rebutted the Examiner's prima facie case of obviousness of representative claim 14 based on the collective teachings of Kwan and Bolgiano. The Examiner's

⁸ Unlike claim 17 which limits the retransmission to the code domain, claims 14 and 15 are not so limited, but can include variances in the code, frequency, or space domains. In this regard, we note that Bolgiano also teaches varying the frequency to the appropriate assigned frequency of the antenna (Bolgiano, col. 17, ll. 29-32).

rejection of claim 14 is therefore sustained as well as claims 15-19 which fall with claim 14.

New Ground of Rejection Under 37 C.F.R. § 41.50(b)

Under 37 C.F.R. § 41.50(b), we enter a new ground of rejection under 35 U.S.C. § 103 for claims 1-13 and 20.

Claims 1-13 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwan and Bolgiano. For the reasons indicated above in connection with the obviousness rejection of representative claim 14, we conclude that the collective teachings of Kwan and Bolgiano teach and suggest all limitations of independent claim 1, and the claim is therefore unpatentable. Our previous discussion of the respective teachings of Kwan and Bolgiano applies equally here, and we incorporate that discussion by reference.⁹

Since Appellants did not separately argue the patentability of any of claims 2-5, 7-13, and 20, we will adopt the Examiner's findings (Ans. 4-6) that these limitations are taught by Kwan. Accordingly, those claims are likewise unpatentable over the cited prior art for the reasons indicated in the Answer.

Although Appellants dispute the Examiner's findings with respect to claim 6 (Reply Br. 2), these arguments pertain to the anticipation rejection under § 102. Nevertheless, to the extent that dependent claim 6 is separately argued with respect to the collective teachings of Kwan and Bolgiano under

⁹ See pp. 5-10, *supra*, of this opinion.

§ 103, we note that skilled artisans would have readily recognized that different numbers of codes could be used for the transmission and retransmissions respectively. At a minimum, Bolgiano's teaching of modulating the data packets with different spreading codes and providing *different PN code for each time slot* would have at least suggested that different numbers of codes could have been used for transmissions in each time slot. (Bolgiano, col. 3, ll. 1-14; col. 17, ll. 34-41). And, even if we assume, without deciding, that these different codes are the same number of codes, using different numbers of codes in lieu of the same number of codes in subsequent transmissions would have been tantamount to the predictable use of prior art elements according to their established functions -- an obvious improvement. *See KSR*, 127 S. Ct. at 1740.

DECISION

We have sustained the Examiner's rejection of claims 14-19. We have not, however, sustained the rejection of claims 1-13 and 20. Furthermore, we have entered a new ground of rejection under 37 C.F.R. § 41.50(b) for claims 1-13 and 20.

This decision contains a new ground of rejection pursuant to 37 C.F.R. § 41.50(b). Section 41.50(b) provides that "[a] new ground of rejection . . . shall not be considered final for judicial review."

Section 41.50(b) also provides that the Appellants, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of

the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

(1) Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the Examiner, in which event the proceeding will be remanded to the Examiner. . . .

(2) Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART
37 C.F.R. § 41.50(b)

gvw

Appeal 2007-3802
Application 10/036,927

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